

What is claimed is:

1. A hydrogen storage material, comprising:  
a plurality of planar molecular layers stacked; and  
a particle being inserted into the planar molecular layers to define an  
5 interlayer distance between the planar molecular layers.
2. The hydrogen storage material of claim 1,  
wherein the particle is at least one of an atom and a molecule.
- 10 3. The hydrogen storage material of claim 1,  
wherein the particle is chemically bound to the planar molecular layers.
4. The hydrogen storage material of claim 1,  
wherein the planar molecular layers are primarily formed of carbon.
- 15 5. The hydrogen storage material of claim 1,  
wherein the interlayer distance between the planar molecular layers, on a  
condition that hydrogen is stored, is 0.8 to 1.2 nm.
- 20 6. The hydrogen storage material of claim 1,  
wherein the particle is an alkaline metal atom.
7. The hydrogen storage material of claim 6,  
wherein the alkaline metal atom is at least one of potassium, rubidium,  
25 and cesium.
8. The hydrogen storage material of claim 1,  
wherein a planer molecule constituting the planar molecular layer  
contains a metal element.

9. The hydrogen storage material of claim 8,  
wherein the metal element is at least one of scandium, titanium,  
vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium,  
aluminium, potassium, rubidium, and cesium.

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10. A method for producing a hydrogen storage material comprising:  
arranging a planar molecular layer material and a metal material at  
different places in a vacuum chamber, followed by sealing the chamber; and  
controlling the temperatures of the planar molecular layer material and  
10 the metal material, independently, to insert a metal atom constituting the metal  
material between planar molecular layers constituting the planar molecular layer  
material.

11. The method for producing a hydrogen storage material of claim 10,  
15 wherein a planar molecule constituting the planar molecular layer  
material is primarily formed of carbon.

12. The method for producing a hydrogen storage material of claim 10,  
wherein the metal material is an alkaline metal.

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13. The method for producing a hydrogen storage material of claim 12,  
wherein the alkaline metal is at least one of potassium, rubidium, and  
cesium.

25 14. The method for producing a hydrogen storage material of claim 10,  
wherein a planer molecule constituting the planar molecular layer  
material contains a metal element.

15. The method for producing a hydrogen storage material of claim 14,  
30 wherein the metal element is at least one of scandium, titanium,

vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, gallium, aluminium, potassium, rubidium, and cesium.

16. A hydrogen storage tank, comprising:

5 a hydrogen storage material including a plurality of planar molecular layers stacked, and a particle being inserted into the planar molecular layers to define an interlayer distance between the planar molecular layers.

17. A hydrogen storage system, comprising:

10 a hydrogen storage tank including a hydrogen storage material which has a plurality of planar molecular layers stacked, and a particle being inserted into the planar molecular layers to define an interlayer distance between the planar molecular layers.

15 18. A fuel cell vehicle, comprising:

a hydrogen storage system comprising a hydrogen storage tank including a hydrogen storage material which has a plurality of planar molecular layers stacked, and a particle being inserted into the planar molecular layers to define an interlayer distance between the planar molecular layers.